

# Composting of Olive Mill Pomace: Process Monitoring and Evaluation of Final Product

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## Abstract

The potential use of olive mill pomace through composting provides an environmentally sustainable method for managing by-products of olive oil production, particularly in olive-growing regions. By converting this waste into a nutrient-rich soil amendment, composting enhances soil fertility, promotes sustainable agriculture, and contributes significantly to waste reduction. Therefore, the key objective of this study is to minimize waste generated by the olive oil industry by transforming olive pomace into a valuable resource, thus reducing the need for landfilling or improper disposal of organic by-products. For this process, compost production was achieved using aerobic bioreactors with forced aeration, where fresh olive mill pomace was mixed with barley straw (bioreactor-1), barley straw + urea (bioreactor-2), and barley straw + sheep manure (bioreactor-3) in mass ratios to adjust the C/N ratio. The entire composting process took five months. Throughout the process, several parameters were monitored, including moisture content, pH, electrical conductivity (EC), organic matter, carbon-to-nitrogen (C/N) ratio, and phenol levels. Promising results were observed as pH, EC, organic matter, C/N ratio, and phenols were reduced over time, indicating an improvement in the quality of the final compost product. The compost produced acts as a natural soil conditioner, reducing the reliance on chemical fertilizers and supporting eco-friendly and sustainable farming practices. This approach not only enhances soil health but also contributes to the circular economy in olive-growing regions by turning waste into a valuable agricultural input.

## Keywords

Olive Pomace, Bioreactors, Composting Process, pH and Moisture Contents, Chemical Profile